Program: BE Biotechnology Engineering

Curriculum Scheme: Revised 2016

Examination: Second Year Semester IV

Course Code: BTC402 and Course Name: Molecular Genetics

Time: 1 hour Max. Marks: 50

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Q.1	This force can stabilize a DNA double-helix
Option A:	Hydrophilic sugar-phosphate groups are found on the exterior of the helix where interaction with water occurs
Option B:	Hydrophobic bases are present in the interior of the helix, each base-pair is stabilized by the same number of hydrogen bonds
Option C:	covalent base stacking interactions may take place between neighboring bases within the same strand in the helix
Option D:	non-covalent N-glycosidic bonds may form between nitrogenous bases in opposite strands in the helix
Q.2	If you suddenly observe linkage between two genes that are present in two chromosomes, this can be due to _____
Option A:	Coupling
Option B:	Translocation
Option C:	Inversion
Option D:	Non-homologous end joining
Q.3	Fluorescent signal strength depends on
Option A:	Probe labelling efficiency
Option B:	Nick translation
Option C:	Repeats of DNA
Option D:	Intermediate RNA-DNA hybrids
Q.4	DNA helicase enzyme involved in base excision repair is _____
Option A:	DNA helicase I
Option B:	DNA helicase II
Option C:	DNA helicase III
Option D:	DNA helicase IV
Q.5	70S prokaryotic ribosome is the complex of _____
Option A:	30S + 50S
Option B:	30S + 40S
Option C:	20S + 60S
Option D:	20S + 30S
Q.6	The wobble hypothesis was devised by _____

Option A:	Arthur Kornberg
Option B:	Francis Crick
Option C:	James Watson
Option D:	William Asbury
Q.7	Lac Operon will be turned on when
Option A:	Lactose is less than glucose
Option B:	Lactose is less in the medium
Option C:	Lactose is more than glucose
Option D:	Glucose is enough in the medium
Q.8	DNA replication in the two strands proceed in opposite direction as they are aligned oppositely with respect to 3’ and 5’ ends (5’————————————-3’ 3’————————————-5’). In this context which of the following is true.
Option A:	The two arms of the DNA Pol are exactly same with same orientation
Option B:	The two arms of the DNA Pol are exactly same with opposite orientation
Option C:	The two arms of the DNA Pol have different catalytic mechanism i.e. one polymerizes 3’ -> 5’ other 5’ -> 3’
Option D:	The two arms are isomers i.e. they have different arrangement of the subunits.
Q.9	Individuals with Turner’s syndrome inherit what chromosomes?
Option A:	XX
Option B:	XO
Option C:	XXY
Option D:	XXX
Q.10	Capping of RNA is necessary as_____
Option A:	It helps us distinguish 5’ from 3’ end
Option B:	It has a rolling action and condenses the transcript as it is produced
Option C:	To protect the transcript from exonuclease
Option D:	To prevent the transcript from sticking to DNA
Q.11	The enzyme involved in amino acid activation
Option A:	ATP synthetase
Option B:	Aminoacyl tRNA synthetase
Option C:	Aminoacyl mRNA synthetase
Option D:	Aminoacyl rRNA synthetase
Q.12	How many prokaryotic DNA polymerases have 5’->3’ proofreading activity?
Option A:	1
Option B:	2
Option C:	3
Option D:	4

Q.13	Mark the INCORRECT statement about minisatellites.
Option A:	Tandemly repeated DNA
Option B:	Form clusters up to 20kb in length
Option C:	Shorter clusters
Option D:	Found in the centromere region
Q.14	Color of the skin in humans is regulated by
Option A:	polygenic effect
Option B:	lethal genes
Option C:	multiple genes
Option D:	incomplete dominance
Q.15	The number of chromosomes a child with Down syndrome has is
Option A:	45
Option B:	46
Option C:	47
Option D:	48
Q.16	Cyclin-CDK complex (here considering S cyclin) when active is responsible for phosphorylating several proteins and this often marks then for destruction by ubiquitination. What would be its effect on Cdt activity?
Option A:	Activation
Option B:	Inactivation
Option C:	Destruction
Option D:	Increased synthesis
Q.17	The eukaryotic initiation codon recognizes_____
Option A:	f-Met-tRNA-f-Met
Option B:	Met-tRNAi-Met
Option C:	f-Met-tRNAi-Met
Option D:	f-Met-tRNA-Met
Q.18	Which of these properties do not agree with trp operon attenuator?
Option A:	It brings about repression of trp operon
Option B:	It consists of one stem loop system
Option C:	It has two codons for tryptophan in sequence
Option D:	Ribosome stalls at the attenuator
Q.19	Lack of independent assortment of two genes is due to
Option A:	recombination
Option B:	crossing over
Option C:	linkage
Option D:	repulsion
Q.20	The catalytic unit of RNA polymerases when placed properly during initiation is just over _____

Option A:	-1 site
Option B:	0 site
Option C:	+1 site
Option D:	– 10 sites
Q.21	A Lac repressor is a tetramer repressed when bound to the inducer. The trp repressor is a _____
Option A:	Dimer inactivated when bound to the inducer
Option B:	Dimer activated on inducer binding
Option C:	Tetramer inactivated on inducer binding
Option D:	Tetramer activated on inducer binding
Q.22	What is the final factor in eukaryotes that releases the peptide and ribosome?
Option A:	eRRF
Option B:	EF2
Option C:	RF3
Option D:	RF4
Q.23	In an experiment you use RNA polymerase without its sigma factor for transcription. What will be the result that you observe?
Option A:	More transcription
Option B:	Less transcription
Option C:	More specific transcription
Option D:	More random transcription
Q.24	After cross-fertilization of true-breeding tall and dwarf plants, the F_1 generation was self-fertilized. The resultant plants have genotype in the ratio
Option A:	1:2:1 (homozygous tall: heterozygous tall: dwarf)
Option B:	1:2:1 (heterozygous tall: homozygous tall: dwarf)
Option C:	3:1 (tall: dwarf)
Option D:	3:1 (dwarf: tall)
Q.25	Which of the following equation shows DNA renaturation reaction?
Option A:	Sec 60
Option B:	$Cot_{1/2}$
Option C:	Tan 30
Option D:	Cot 40